

NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES

CHAPTER He-P 4000

PART He-P 4033 SPECIFIC LICENSES OF BROAD SCOPE FOR OTHER THAN HUMAN USE

REVISION NOTE:

Doc. #6942, effective 2-1-99, repealed Parts He-P 2030, 2031, 2032, 2033, 2034, 2035, 2042 and 2093 relative to Radiation and Radioactive Material and adopted new rules to replace them and renumbered them as He-P 4030, 4031, 4032, 4033, 4034, 4035, 4093 and 4096.

He-P 4033.01 Purpose. This part shall prescribe requirements for the issuance of specific licenses of broad scope for radioactive material and certain regulations governing holders of such licenses.

Source. (See Revision Note at part heading for He-P 4033)
#6942, eff 2-1-99

He-P 4033.02 Scope. The provisions and requirements of this part shall be in addition to, and not in substitution for, other requirements of this chapter.

Source. (See Revision Note at part heading for He-P 4033)
#6942, eff 2-1-99

He-P 4033.03 Types of Specific Licenses of Broad Scope.

(a) Type A specific license of broad scope shall be a specific license authorizing receipt, acquisition, ownership, possession, use, and transfer of any chemical or physical form of a quantity of radioactive material usually in the multicurie range specified in the license, but not exceeding quantities specified in the license, for any authorized purpose.

(b) A Type B specific license of broad scope shall be:

(1) A specific license which allows any chemical or physical form of radioactive material specified in He-P 4033.07, Table 4033.1, for any authorized purpose.

(2) A specific license whereby the possession limit, if only one radionuclide is possessed thereunder, shall be the quantity specified for that radionuclide in He-P 4033.07, Table 4033.1, Column I.

(3) A specific license whereby if two or more radionuclides are possessed thereunder, the possession limit for each shall be determined as follows:

a. For each radionuclide, determine the ratio of the quantity possessed to the applicable quantity specified in He-P 4033.07, Table 4033.1, Column I, for that radionuclide; and

b. The sum of the ratios for all radionuclides possessed under the license shall not exceed unity.

(c) A Type C specific license of broad scope shall be:

(1) A specific license authorizing receipt, acquisition, ownership, possession, use, and transfer of

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any chemical or physical form of radioactive material specified in He P 4033.07, Table 4033.1, for any authorized purpose.

(2) A specific license whereby the possession limit, if only one radionuclide, is possessed thereunder, shall be the quantity specified for that radionuclide in He-P 4033.07, Table 4033.1, Column II.

(3) A specific license whereby if two or more radionuclides are possessed thereunder, the possession limit shall be determined for each as follows:

- a. For each radionuclide, determine the ratio of the quantity possessed to the applicable quantity specified in He-P 4033.07, Table 4033.1, Column II, for that radionuclide: and
- b. The sum of the ratios for all radionuclides possessed under the license shall not exceed unity.

Source. (See Revision Note at part heading for He-P 4033)
#6942, eff 2-1-99

He-P 4033.04 Application for Specific Licenses of Broad Scope. An application for specific license of broad scope shall be filed on a form as described in He-P 4004.

Source. (See Revision Note at part heading for He-P 4033)
#6942, eff 2-1-99

He-P 4033.05 Requirements for the Issuance of Specific Licenses of Broad Scope.

(a) An application for a Type A specific license of broad scope shall be approved if:

- (1) The applicant satisfies the requirements specified in He-P 4030.09.
- (2) The applicant has engaged in a reasonable number of activities involving the use of radioactive material;
- (3) The applicant has established administrative controls and provisions relating to organization and management, procedures, record keeping, material control and accounting and management review that are necessary to assure safe operations, including:
 - a. The establishment of a radiation safety committee composed of such persons as a radiological safety officer, a representative of management, and persons trained and experienced in the safe use of radioactive material;
 - b. The appointment of a radiological safety officer who is qualified by training and experience in radiation protection, and who is available for advice and assistance on radiological safety matters; and
 - c. The establishment of appropriate administrative procedures to assure:
 1. Control of procurement and use of radioactive material;

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2. Completion of safety evaluations of proposed uses of radioactive material which take into consideration such matters as the adequacy of facilities and equipment, training and experience of the user and the operating or handling procedures; and
3. Review, approval and recording by the radiation safety committee of safety evaluations of proposed uses prepared in accordance with He-P 4033.05(a)(3)c.2. of this paragraph prior to use of the radioactive material.

(b) An application for a Type B specific license of broad scope shall be approved if:

- (1) The applicant satisfies the general requirements specified in He-P 4030.09; and
- (2) The applicant has established administrative controls and provisions relating to organization and management, procedures, record keeping, material control and accounting and management review that are necessary to assure safe operations, including:
 - a. The appointment of a radiological safety officer who is qualified by training and experience in radiation protection, who is available for advice and assistance on radiological safety matters; and
 - b. The establishment of appropriate administrative procedures to assure:
 1. Control of procurement and use of radioactive material;
 2. Completion of safety evaluations of proposed uses of radioactive material which take into consideration such matters as the adequacy of facilities and equipment, training and experience of the user and the operating or handling procedures; and
 3. Review, approval and recording by the radiological safety officer of safety evaluations of proposed uses prepared in accordance with He-P 4033.05(b)(2)b.2., prior to use of the radioactive material.

(c) An application for a Type C specific license of broad scope may be approved if:

- (1) The applicant satisfies the requirements specified in He-P 4030.09; and
- (2) The applicant submits a statement that radioactive material shall be used only by, or under the direct supervision of, individuals who have received:
 - a. A college degree at the bachelor level, or equivalent training and experience, in the physical or biological sciences or in engineering; and
 - b. At least 40 hours of training and experience in the safe handling of radioactive materials, and in the characteristics of ionizing radiation, units of radiation doses and quantities, radiation detection instrumentation, and biological hazards of exposure to radiation appropriate to the type and forms of radioactive material to be used; and

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(3) The applicant has established administrative controls and provisions relating to procurement of radioactive material, procedures, record keeping, material control and accounting and management review necessary to assure safety operations.

Source. (See Revision Note at part heading for He-P 4033)
#6942, eff 2-1-99

He-P 4033.06 Conditions of Specific Licenses of Broad Scope.

(a) Unless specifically authorized pursuant to other sections of He-P 4033, persons licensed under this section shall not:

- (1) Conduct tracer studies in the environment involving direct release of radioactive material;
- (2) Receive, acquire, own, possess, use, transfer, or import devices containing 100,000 curies or more of radioactive material in sealed sources to be used for irradiation of materials;
- (3) Conduct activities for which a specific license issued by the DHHS/BRH is required; or
- (4) Add or cause the addition of radioactive material to any food, beverage, cosmetic, drug, or other product designed for ingestion or inhalation by, or application to, a human being.

(b) Each Type A specific license of broad scope issued by the DHHS/BRH shall be subject to the condition that radioactive material possessed under the license shall be used only by, or under the direct supervision of, individuals approved by the licensee's radiation safety committee.

(c) Each Type B specific license of broad scope issued by the DHHS/BRH shall be subject to the condition that radioactive material possessed under the license shall be used only by, or under the direct supervision of, individuals approved by the licensee's radiological safety officer.

(d) Each Type C specific license of broad scope issued by the DHHS/BRH shall be subject to the condition that radioactive material possessed under the license shall be used only by, or under the direct supervision of, individuals who satisfy the requirements of He-P 4033.05(c).

Source. (See Revision Note at part heading for He-P 4033)
#6942, eff 2-1-99

He-P 4033.07 License quantities for licenses of broad scope shall be as follows:

Table 4033.1 Quantities of Radioactive Material for Licenses of Broad Scope.

RADIOACTIVE MATERIAL	COLUMN I CURIES	COLUMN II CURIES
Antimony-122	1.0	0.01
Antimony-124	1.0	0.01
Antimony-125	1.0	0.01

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RADIOACTIVE MATERIAL	COLUMN I CURIES	COLUMN II CURIES
Arsenic-73	10.0	0.1
Arsenic-74	1.0	0.01
Arsenic-76	1.0	0.01
Arsenic-77	10.0	0.1
Barium-131	10.0	0.1
Barium-140	1.0	0.01
Beryllium-7	10.0	0.1
Bismuth-210	0.1	0.001
Bromine-82	10.0	0.1
Cadmium-109	1.0	0.01
Cadmium-115m	1.0	0.01
Cadmium-115	10.0	0.1
Calcium-45	1.0	0.01
Calcium-47	10.0	0.1
Carbon-14	100.0	1.0
Cerium-141	10.0	0.1
Cerium-143	10.0	0.1
Cerium-144	0.1	0.001
Cesium-131	100.0	1.0
Cesium-134m	100.0	1.0
Cesium 134	0.1	0.001
Cesium-135	1.0	0.01
Cesium-136	10.0	0.1
Cesium-137	0.1	0.001
Chlorine-36	1.0	0.01
Chlorine-38	100.0	1.0
Chromium-51	100.0	1.0
Cobalt-57	10.0	0.1
Cobalt-58m	100.0	1.0

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RADIOACTIVE MATERIAL	COLUMN I CURIES	COLUMN II CURIES
Cobalt-58	1.0	0.01
Cobalt-60	0.1	0.001
Copper-64	10.0	0.1
Dysprosium-165	100.0	1.0
Dysprosium-166	10.0	0.1
Erbium-169	10.0	0.1
Erbium-171	10.0	0.1
Europium-152 (9.2 h)	10.0	0.1
Europium-152 (13 y)	0.1	0.001
Europium-154	0.1	0.001
Europium-155	1.0	0.01
Fluorine-18	100.0	1.0
Gadolinium-153	1.0	0.01
Gadolinium-159	10.0	0.1
Gallium-72	10.0	0.1
Germanium-71	100.0	1.0
Gold-198	10.0	0.1
Gold-199	10.0	0.1
Hafnium-181	1.0	0.01
Holmium-166	10.0	0.1
Hydrogen-3	100.0	1.0
Indium-113m	100.0	1.0
Indium-114m	1.0	0.01
Indium-115m	100.0	1.0
Indium-115	1.0	0.01
Iodine-125	0.1	0.001
Iodine-126	0.1	0.001
Iodine-129	0.1	0.001
Iodine-131	0.1	0.001

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RADIOACTIVE MATERIAL	COLUMN I CURIES	COLUMN II CURIES
Iodine-132	10.0	0.1
Iodine-133	1.0	0.01
Iodine-134	10.0	0.1
Iodine-135	1.0	0.01
Iridium-192	1.0	0.01
Iridium-194	10.0	0.1
Iron-55	10.0	0.1
Iron-59	1.0	0.01
Krypton-85	100.0	1.0
Krypton-87	10.0	0.1
Lanthanum-140	1.0	0.01
Lutetium-177	10.0	0.1
Manganese-52	1.0	0.01
Manganese-54	1.0	0.01
Manganese-56	10.0	0.1
Mercury-197m	10.0	0.1
Mercury-197	10.0	0.1
Mercury-203	1.0	0.01
Molybdenum-99	10.0	0.1
Neodymium-147	10.0	0.1
Neodymium-149	10.0	0.1
Nickel-59	10.0	0.1
Nickel-63	1.0	0.01
Nickel-65	10.0	0.1
Niobium-93m	1.0	0.01
Niobium-95	1.0	0.01
Niobium-97	100.0	1.0
Osmium-185	1.0	0.01
Osmium-191m	100.0	1.0

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RADIOACTIVE MATERIAL	COLUMN I CURIES	COLUMN II CURIES
Osmium-191	10.0	0.1
Osmium-193	10.0	0.1
Palladium-103	10.0	0.1
Palladium-109	10.0	0.1
Phosphorus-32	1.0	0.01
Phosphorus-33	10.0	0.1
Platinum-191	10.0	0.1
Platinum-193m	100.0	1.0
Platinum-193	10.0	0.1
Platinum-197m	100.0	1.0
Platinum-197	10.0	0.1
Polonium-210	0.01	0.0001
Potassium-42	1.0	0.01
Praseodymium-142	10.0	0.1
Praseodymium-143	10.0	0.1
Promethium-147	1.0	0.01
Promethium-149	10.0	0.1
Radium-226	0.01	0.0001
Rhenium-186	10.0	0.1
Rhenium-188	10.0	0.1
Rhodium-103m	1,000.0	10.0
Rhodium-105	10.0	0.1
Rubidium-86	1.0	0.01
Rubidium-87	1.0	0.01
Ruthenium-97	100.0	1.0
Ruthenium-103	1.0	0.01
Ruthenium-105	10.0	0.1
Ruthenium-106	0.1	0.001
Samarium-151	1.0	0.01

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RADIOACTIVE MATERIAL	COLUMN I CURIES	COLUMN II CURIES
Samarium-153	10.0	0.1
Scandium-46	1.0	0.01
Scandium-47	10.0	0.1
Scandium-48	1.0	0.01
Selenium-75	1.0	0.01
Silicon-31	10.0	0.1
Silver-105	1.0	0.01
Silver-110m	0.1	0.001
Silver-111	10.0	0.1
Sodium-22	0.1	0.001
Sodium-24	1.0	0.01
Strontium-85m	1,000.0	10.0
Strontium-85	1.0	0.01
Strontium-89	1.0	0.01
Strontium-90	0.01	0.0001
Strontium-91	10.0	0.1
Strontium-92	10.0	0.1
Sulphur-35	10.0	0.1
Tantalum-182	1.0	0.01
Technetium-96	10.0	0.1
Technetium-97m	10.0	0.1
Technetium-97	10.0	0.1
Technetium-99m	100.0	1.0
Technetium-99	1.0	0.01
Tellurium-125m	1.0	0.01
Tellurium-127m	1.0	0.01
Tellurium-127	10.0	0.1
Tellurium-129m	1.0	0.01
Tellurium-129	100.0	1.0

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RADIOACTIVE MATERIAL	COLUMN I CURIES	COLUMN II CURIES
Tellurium-131m	10.0	0.1
Tellurium-132	1.0	0.01
Terbium-160	1.0	0.01
Thallium-200	10.0	0.1
Thallium-201	10.0	0.1
Thallium-202	10.0	0.1
Thallium-204	1.0	0.01
Thulium-170	1.0	0.01
Thulium-171	1.0	0.01
Tin-113	1.0	0.01
Tin-125	1.0	0.01
Tungsten-181	1.0	0.01
Tungsten-185	1.0	0.01
Tungsten-187	10.0	0.1
Vanadium-48	1.0	0.01
Xenon-131m	1,000.0	10.0
Xenon-133	100.0	1.0
Xenon-135	100.0	1.0
Ytterbium-175	10.0	0.1
Yttrium-90	1.0	0.01
Yttrium-91	1.0	0.01
Yttrium-92	10.0	0.1
Yttrium-93	1.0	0.01
Zinc-65	1.0	0.01
Zinc-69m	10.0	0.1
Zinc-69	100.0	1.0
Zirconium-93	1.0	0.01
Zirconium-95	1.0	0.01
Zirconium-97	1.0	0.01

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RADIOACTIVE MATERIAL	COLUMN I CURIES	COLUMN II CURIES
Any Radioactive material other than source material, special nuclear material, or alpha emitting radioactive material not listed above.	0.1	0.001

Source. (See Revision Note at part heading for He-P 4033)
#6942, eff 2-1-99

PART He-P 4034 RADIATION SAFETY REQUIREMENTS FOR INDUSTRIAL RADIOGRAPHIC OPERATIONS

REVISION NOTE:

Doc. #6942, effective 2-1-99, repealed Parts He-P 2030, 2031, 2032, 2033, 2034, 2035, 2042 and 2093 relative to Radiation and Radioactive Material and adopted new rules to replace them and renumbered them as He-P 4030, 4031, 4032, 4033, 4034, 4035, 4093 and 4096.

He-P 4034.01 Purpose. This part prescribes requirements for the issuance of licenses or registration for the industrial use of sources of radiation and radiation safety requirements for persons using these sources of radiation in industrial radiography.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.02 Scope. The requirements of this part are in addition to, and not in substitution for, other requirements of these regulations and cover both radiation machines and sealed radioactive sources but do not apply to medical uses of sources of radiation.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.03 Definitions. The following definitions shall apply to this part:

(a) "Annual refresher safety training" means a review conducted or provided by the licensee or registrant for its employees on radiation safety aspects of industrial radiography.

(b) "ANSI" means the American National Standards Institute.

(c) "Associated equipment" means equipment that drives, guides, or otherwise comes in contact with the source, when it is used as an exposure head in conjunction with a radiographic exposure device to make radiographic exposures.

(d) "Cabinet radiography" means industrial radiography conducted in an enclosure or cabinet so shielded that every location on the exterior meets the conditions specified in He-P 4020.

(e) "Cabinet X-ray system" or "cabinet" means an X-ray system with the X-ray tube installed in an enclosure independent of existing architectural structures except the floor and is intended to contain at least that portion of a material being irradiated, provide radiation attenuation, and exclude personnel from its interior during generation of radiation.

(f) "Certifiable cabinet X-ray system" means an existing uncertified x-ray system that has been modified to meet the certification requirements specified in 21 CFR 1020.40.

(g) "Certified cabinet X-ray system" means an x-ray system that has been certified in accordance with 21 CFR 1010.2 as being manufactured and assembled pursuant to the provisions of 21 CFR 1020.40.

(h) "Certifying entity" means an independent certifying organization meeting the requirements in He-P 4034 Appendix A or an Agreement State meeting the requirements in He-P 4034 Appendix A, Parts II and III.

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(i) "Collimator" means a radiation shield that is placed on the end of the guide tube or directly onto a radiographic exposure device to restrict the size of the radiation beam when the sealed source is cranked into position to make a radiographic exposure.

(j) "Control cable" or "drive cable" means the cable that is connected to the source assembly and used to drive the source to and from the exposure location.

(k) "Control drive mechanism" means a device that enables the source assembly to be moved into and out of the exposure device.

(l) "Control tube" means a protective sheath which connects the control drive mechanism to the radiographic exposure device for guiding the control cable.

(m) "Exposure head" or "source stop" means a device that locates the gamma radiography sealed source in the selected working position.

(n) "Field station" means a facility from which sources of radiation may be stored or used and from which equipment is dispatched.

(o) "Guide tube" or "Projection Sheath" means a flexible or rigid, "J" tube, for guiding the source assembly and the attached control cable from the exposure device to the exposure head which may also include the connections necessary for attachment to the exposure device and to the exposure head.

(p) "Hands-on experience" means experience in all of those areas considered to be directly involved in the radiography process, and includes taking radiographs, calibration of survey instruments, operational and performance testing of survey instruments and devices, film development, posting of radiation areas, transportation of radiography equipment, posting of records and radiation area surveillance.

(q) "Independent certifying organization" means an independent organization that meets all of the criteria of He-P 4034 Appendix A.

(r) "Industrial radiography" or "radiography" means an examination of the structure of materials by nondestructive methods, utilizing ionizing radiation to make radiographic images.

(s) "Lay-barge radiography" means industrial radiography performed on any water vessel used for laying pipe.

(t) "Offshore platform radiography" means industrial radiography conducted from a platform over a body of water.

(u) "Permanent radiographic installation" means an enclosed shielded room, cell, or vault, not located at a temporary jobsite, in which radiography is performed.

(v) "Practical examination" means a demonstration through application of the safety rules and principles in industrial radiography including use of all procedures and equipment to be used by radiographic personnel.

(w) "Radiation safety officer for industrial radiography" means an individual with the responsibility for the overall radiation safety program on behalf of the licensee or registrant and who meets the requirements

of He-P 4034.16.

(x) "Radiographer" means any individual who performs or who, in attendance at the site where the sources of radiation are being used, personally supervises industrial radiographic operations and who is responsible to the licensee or registrant for assuring compliance with the requirements of the DHHS/BRH rules and the conditions of the license or the registration.

(y) "Radiographer certification" means written approval received from a certifying entity stating that an individual has satisfactorily met the radiation safety, testing, and experience criteria in He-P 4034.17.

(z) "Radiographer's assistant" means any individual who under the direct supervision of a radiographer, uses radiographic exposure devices, sources of radiation, related handling tools, or radiation survey instruments in industrial radiography.

(aa) "Radiographic exposure device" or "Camera" or "Projector" means any instrument containing a source of radiation fastened or contained therein, in which the source of radiation or shielding thereof may be moved, or otherwise changed, from a shielded to unshielded position for purposes of making a radiographic exposure.

(ab) "Radiographic operations" means all activities performed with a radiographic exposure device, or with a radiation machine to include use, transport performing surveys to confirm the adequacy of boundaries, setting up equipment, and any activity inside restricted area boundaries.

(ac) "S-tube" means a tube through which the radioactive source travels when inside a radiographic exposure device.

(ad) "Shielded position" means the location within the radiographic exposure device or storage container that, by manufacturer's design, is the proper location for storage of the sealed source.

(ae) "Source assembly" means an assembly that consists of the sealed source and a connector that attaches the source to the control cable and may include a stop ball to secure the source in the shielded position.

(af) "Source changer" means a device designed and used for replacement of sealed sources in radiographic exposure devices which may also be used for transporting and storing sealed sources.

(ag) "Storage area" means any locked location, facility, or vehicle that is used to store, secure and prevent unauthorized removal of a radiographic exposure device, a radiation machine, or a storage container when it is not used for radiographic operations.

(ah) "Storage container" means a device in which sealed sources or radiation machines are transported or stored.

(ai) "Temporary jobsite" means a location where radiographic operations are performed and where radioactive material may be stored other than those location(s) of use authorized on the license or registration certificate.

(aj) "Underwater radiography" means radiographic operations performed when the radiographic exposure device or radiation machine and/or related equipment are beneath the surface of the water.

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Source. (See Revision Note at part heading for He-P 4034)
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He-P 4034.04 Exemptions.

(a) Certified and certifiable cabinet x-ray systems, including those designed to allow admittance of individuals, are exempt from the requirements of this part except that:

(1) No registrant shall permit any individual to operate a cabinet x-ray system until the individual has received a copy of and instruction in the operating procedures for the unit.

(2) Tests for proper operation of interlocks must be conducted and recorded at intervals not to exceed six months.

(3) The registrant shall perform an evaluation to determine compliance with He-P 4020.13(a) through (f), and 21 CFR 1020.40, at intervals not to exceed one year.

(4) Records of the evaluation required in He-P 4034.03(a) (1)(2) and (3) shall be maintained for DHHS/BRH inspection until disposal is authorized by the DHHS/BRH.

(b) Certified and certifiable cabinet x-ray systems shall be maintained in compliance with 21 CFR 1020.40 and no modification shall be made to the system unless prior DHHS/BRH approval has been granted.

(c) Industrial uses of hand-held light intensified imaging devices are exempt from the regulations in this part if the exposure level 18 inches from the source of radiation to any individual does not exceed 2 millirem per hour.

(d) Industrial uses of hand-held light intensified imaging devices with exposure levels that exceed the 2 millirem per hour level shall meet the applicable requirements of this part and He-P 4040 or He-P 4030, as applicable.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.05 Licensing and Registration Requirements for Industrial Radiography Operations. The DHHS/BRH shall approve an application for a specific license for the use of radioactive material or a registration for use of radiation machines if:

(a) The applicant or registrant satisfies the general requirements specified in He-P 4040 for radiation machine facilities or He-P 4030 for radioactive material, and any special requirements contained in this part;

(b) The applicant submits a program for training radiographers and radiographers' assistants that meets the requirements of He-P 4034.17.

(1) After January 1, 2001, a license applicant need not describe its initial training and examination program for radiographers in the subjects outlined in He-P 4034.17(h).

(2) From the effective date of this part to January 1, 2001, a license applicant may affirm that all individuals acting as industrial radiographer's will be certified in radiation safety by a certifying entity before commencing duty as radiographers. This affirmation substitutes for a description of

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its initial training and examination program for radiographers in the subjects outlined in He-P 4034.7(h).

(c) The applicant or registrant submits procedures for verifying and documenting the certification status of radiographers and for ensuring that the certification of individuals acting as radiographers remains valid;

(d) The applicant or registrant submits written operating and emergency procedures as described in He-P 4034.17(g).

(e) The applicant or registrant submits a description of a program for inspections of the job performance of each radiographer and radiographer's assistant at intervals not to exceed 6 months as described in He-P 4034.17(e).

(f) The applicant or registrant submits a description of the applicant's overall organizational structure as it applies to the radiation safety responsibilities in industrial radiography, including specified delegation of authority and responsibility;

(g) The applicant or registrant submits the qualifications of the individual(s) designated as the Radiation Safety Officer as described in He-P 4034.16.

(h) An applicant intends to perform leak testing of sealed sources or exposure devices containing depleted uranium (DU) shielding, or intends to analyze their own wipe samples, the applicant shall describe the procedures for performing these tests to include:

- (1) Methods of collecting the samples;
- (2) Qualifications of the individual who analyzes the samples;
- (3) Instruments to be used; and
- (4) Methods of analyzing the samples.

(i) The applicant or registrant intends to perform calibrations of survey instruments and alarming rate meters, the applicant shall describe methods to be used and the experience of the person(s) who will perform the calibrations.

(j) All calibrations of survey instruments and alarming ratemeters shall be performed according to the procedures described and at the intervals prescribed in He-P 4034.09 and He-P 4034.20(o)(4).

(j) The applicant or registrant identifies and describes the location(s) of all field stations and permanent radiographic installations;

(k) The applicant or registrant identifies the locations where all records required by this and other parts of these regulations will be maintained;

(l) A license application or radiation machine use includes underwater radiography, a description of:

- (1) Radiation safety procedures and radiographer responsibilities unique to the performance of underwater radiography;

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(2) Radiographic equipment and radiation safety equipment unique to underwater radiography; and

(3) Methods for gas-tight encapsulation of equipment; and

(m) An application or radiation machine use includes offshore platform and/or lay-barge radiography, a description of:

(1) Transport procedures for radioactive material to be used in industrial radiographic operations;

(2) Storage facilities for radioactive material; and

(3) Methods for restricting access to radiation areas.

(n) Each registrant shall comply with the requirements, as appropriate, of He-P 4034.04 for use of radiation machines in industrial radiographic operations.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.06 Performance Requirements for Industrial Radiography Equipment. Equipment used in industrial radiographic operations shall meet the following minimum criteria:

(a) Each radiographic exposure device, source assembly or sealed source, and all associated equipment must meet the requirements specified in American National Standard Institute, N432-1980 "Radiological Safety for the Design and Construction of Apparatus for Gamma Radiography," (published as NBS Handbook 136, issued January 1981);

(b) In addition to the requirements specified in He-P 4034.06(a), the following requirements apply to radiographic exposure devices, source changers, source assemblies and sealed sources;

(1) The licensee shall ensure that each radiographic exposure device has attached to it a durable, legible, clearly visible label bearing the:

a. Chemical name or symbol and mass number of the radionuclide in the device;

b. Activity and the date on which this activity was last measured;

c. Model or product code and serial number of the sealed source;

d. Manufacturer's identity of the sealed source; and

e. Licensee's name, address, and telephone number.

(2) Radiographic exposure devices intended for use as Type B transport containers must meet the applicable requirements of He-P 4037.

(3) Modification of radiographic exposure devices, source changers, and source assemblies and associated equipment is prohibited, unless the design of any replacement component, including

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source holder, source assembly, controls or guide tubes would not compromise the design safety features of the system and such modifications have been approved by the DHHS/BRH.

(c) In addition to the requirements specified in He-P 4034.06(a) and (b) of this section, the following requirements apply to radiographic exposure devices, source assemblies, source changers, and associated equipment that allow the source to be moved out of the device for radiographic operations.

(1) The coupling between the source assembly and the control cable shall be designed in such a manner that the source assembly will not become disconnected if cranked outside the guide tube. The coupling must be such that it cannot be unintentionally disconnected under normal and reasonably foreseeable abnormal conditions.

(2) The device shall automatically secure the source assembly when it is cranked back into the fully shielded position within the device.

(3) This securing system required in He-P 4034.06(c)(2) shall only be released by means of a deliberate operation on the exposure device.

(4) The outlet fittings, lock box, and drive cable fittings on each radiographic exposure device shall be equipped with safety plugs or covers which must be installed during storage and transportation.

(5) Each sealed source or source assembly shall have attached to it or engraved on it, a durable, legible, visible label with the words: "DANGER -- RADIOACTIVE."

(6) The label required in He-P 4034.05(c)(5) shall not interfere with the safe operation of the exposure device or associated equipment.

(7) The guide tube shall:

a. Be able to withstand a crushing test that closely approximates the crushing forces that are likely to be encountered during use; and

b. Be able to withstand a kinking resistance test that closely approximates the kinking forces that are likely to be encountered during use.

(8) Guide tubes shall be used when moving the source out of the device.

(9) An exposure head or similar device designed to prevent the source assembly from passing out of the end of the guide tube shall be attached to the outermost end of the guide tube during industrial radiography operations.

(10) The guide tube exposure head connection shall be able to withstand the tensile test for control units specified in ANSI N432-1980.

(11) Source changers shall provide a system for ensuring that the source will not be accidentally withdrawn from the changer when connecting or disconnecting the drive cable to or from a source assembly.

(d) All radiographic exposure devices and associated equipment in use after January 10, 1996, shall

comply with the requirements of He-P 4034.06.

(e) Notwithstanding He-P 4034.06(a), equipment used in industrial radiographic operations may not comply with I 8.9.2(c) of the Endurance Test in American National Standards Institute N432-1980, if the prototype equipment has been tested using a torque value representative of the torque that an individual using the radiography equipment can reasonably exert on the lever or crankshaft of the drive mechanism.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.07 Limits on External Radiation Levels From Storage Containers and Source Changers.
The maximum exposure rate limits for storage containers and source changers are 2 millisieverts (200 mrem) per hour at any exterior surface, and 0.1 millisieverts (10 mrem) per hour at 1 meter from any exterior surface with the sealed source in the shielded position.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.08 Locking of Radiographic Exposure Devices, Storage Containers and Source Changers.

(a) Each radiographic exposure device shall have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position.

(b) The exposure device and/or its container shall be kept locked with key removed if applicable, when not under the direct surveillance of a radiographer or a radiographer's assistant except at permanent radiographic installations as stated in He-P 4034.22.

(c) During radiographic operations the sealed source assembly shall be secured in the shielded position each time the source is returned to that position.

(d) Each sealed source storage container and source changer shall have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position.

(e) Storage containers and source changers shall be kept locked with key removed if applicable, when containing sealed sources except when under the direct surveillance of a radiographer or a radiographer's assistant.

(f) The control panel of each radiation machine shall be equipped with a lock that will prevent the unauthorized use of an x-ray system or the accidental production of radiation.

(g) The radiation machine shall be kept locked and the key removed at all times except when under the direct visual surveillance of a radiographer or a radiographer's assistant.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.09 Radiation Survey Instruments.

(a) The licensee or registrant shall keep sufficient calibrated and operable radiation survey instruments

at each location where sources of radiation are present to make the radiation surveys required by this part and by He-P 4022.

(b) Instrumentation required by He-P 4034.09(a) shall be capable of measuring a range from 0.02 millisieverts (2 mrem) per hour through 0.01 sievert (1 rem) per hour.

(c) The licensee or registrant shall have each radiation survey instrument required under He-P 4034.09(a) calibrated:

(1) At energies appropriate for use and at intervals not to exceed 6 months or after instrument servicing, except for battery changes;

(2) For linear scale instruments, at two points located approximately one-third and two-thirds of full-scale on each scale; for logarithmic scale instruments, at mid-range of each decade, and at two points of at least one decade; and for digital instruments, at 3 points between 0.02 and 10 millisieverts (2 and 1000 mrem) per hour; and

(3) So that an accuracy within plus or minus 20 percent of the calibration source can be demonstrated at each point checked.

(d) The licensee shall maintain records of the results of the instrument calibrations in accordance with He-P 4034.26.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.10 Leak Testing and Replacement of Sealed Sources.

(a) The replacement of any sealed source fastened to or contained in a radiographic exposure device and leak testing of any sealed source shall be performed by persons authorized to do so by the DHHS/BRH, the U.S. Nuclear Regulatory Commission, or another Agreement State.

(b) The opening, repair, or modification of any sealed source shall be performed by persons specifically authorized to do so by the DHHS/BRH, the NRC, or another Agreement State.

(c) Each licensee who uses a sealed source shall have the source tested for leakage at intervals not to exceed 6 months.

(d) The leak testing of a sealed source shall include:

(1) A method approved by the DHHS/BRH, the NRC, or by another Agreement State.

(2) A wipe sample taken from the nearest accessible point to the sealed source where contamination might accumulate.

(3) An analysis of the wipe sample for radioactive contamination which is capable of detecting the presence of 185 Becquerel (0.005 μ Ci) of radioactive material on the test sample.

(4) Performance of the wipe sample by a person specifically authorized by the DHHS/BRH, the

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NRC, or another Agreement State.

- (e) The licensee shall maintain records of the leak tests in accordance with He-P 4034.27.
- (f) Unless a sealed source is accompanied by a certificate from the transferor that shows that it has been leak tested within 6 months before the transfer, it shall not be used by the licensee until tested for leakage.
- (g) Sealed sources that are in storage and not in use shall not require leak testing.
- (h) Sealed sources that are in storage and not in use shall be tested before use or transfer to another person if the interval of storage exceeds 6 months.
- (i) Any test conducted pursuant to He-P 4034.10 of this that reveals the presence of 185 becquerel (0.005 μ Ci) or more of removable radioactive material shall be considered evidence that the sealed source is leaking.
- (j) If a sealed source is found to be leaking, the licensee shall immediately withdraw the equipment involved from use and shall have it decontaminated and repaired or disposed of in accordance with DHHS/BRH regulations.
- (k) If a sealed source is found to be leaking, a report must be filed with the DHHS/BRH within 5 days of the test, describing the equipment involved, the test results, and the corrective action taken.
- (l) Each exposure device using depleted uranium (DU) shielding and an "S" tube configuration shall:
 - (1) Be tested for DU contamination at intervals not to exceed 12 months;
 - (2) Be analyzed by a method capable of detecting the presence of 185 becquerel (0.005 μ Ci) of radioactive material on the test sample; and
 - (3) Have the test performed by a person specifically authorized by the DHHS/BRH, the NRC, or another Agreement State to perform the analysis.
- (m) Should the testing required in He-P 4034.10(l) reveal the presence of DU contamination, the exposure device shall be removed from use until an evaluation of the wear of the S-tube has been made.
- (n) Should the evaluation in He-P 4034.10(m) reveal that the S-tube is worn through, the device shall not be used again.
- (o) DU shielded devices shall not have to be tested for DU contamination while in storage and not in use.
- (p) Before using or transferring a DU device, the device shall be tested for DU contamination if the interval of storage exceeds 12 months.
- (q) A record of the DU leak-test shall be made in accordance with He-P 4034.27.

Source. (See Revision Note at part heading for He-P 4034)

#6942, eff 2-1-99

He-P 4034.11 Quarterly Inventory.

(a) Each licensee or registrant shall conduct a quarterly physical inventory to account for all sources of radiation and for all devices containing depleted uranium which have been received and possessed under the license.

(b) The licensee or registrant shall maintain records of the quarterly inventory in accordance with He-P 4034.27.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.12 Inspection and Maintenance of Radiation Machines, Radiographic Exposure Devices, Transport and Storage Containers, Associated Equipment, Source Changers, and Survey Instruments.

(a) The licensee or registrant shall perform visual and operability checks on survey meters, radiation machines, radiographic exposure devices, transport and storage containers, associated equipment and source changers at the start of each days use, or work shift, to ensure that:

- (1) The equipment is in good working condition;
- (2) The sources are adequately shielded; and
- (3) Required labeling is present.

(b) Survey instrument operability shall be performed using check sources or other appropriate means.

(c) Each licensee or registrant shall conduct a program for inspection and maintenance of radiation machines, radiographic exposure devices, source changers, associated equipment, transport and storage containers, and survey instruments at intervals not to exceed 3 months or before the first use thereafter to ensure the proper functioning of components important to safety is in accordance with manufacturer's specifications.

(d) Each licensee or registrant shall ensure that all replacement components for radiation machines, radiographic exposure devices, source changers, associated equipment, transport and storage containers and survey instruments meet design specifications.

(e) If any equipment problems are found, the equipment shall be removed from service and labeled as defective until repaired.

(f) The licensee's inspection and maintenance program shall include procedures to assure that Type B packages are shipped and maintained in accordance with the certificate of registration.

(g) Records of equipment problems and of any maintenance performed under He-P 4034.12 shall be made in accordance with He-P 4034.30.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.13 Permanent Radiographic Installations.

(a) Each entrance that is used for personnel access to the high radiation area in a permanent radiographic installation shall be equipped with:

(1) An entrance control of the type described in He-P 4022.04 that causes the radiation level upon entry into the area to be reduced; or

(2) Conspicuous visible and audible warning signals to warn of the presence of radiation as follows:

a. The visible signal must be actuated by radiation whenever the source is exposed or the machine is energized.

b. The audible signal must be actuated when an attempt is made to enter the installation while the source is exposed or the machine is energized.

(b) The alarm system described in He-P 4034.13(2)b. shall be tested for proper operation of both the visible and audible signals, with a radiation source, each day before the installation is used for radiographic operations.

(c) Entrance control devices that reduce the radiation level upon entry as designated in He-P 4034.13(a)(1) shall be tested monthly.

(d) If an entrance control device or an alarm is not operating properly, it shall be immediately labeled as defective and repaired within 7 calendar days.

(e) An installation with a defective entrance control device or an alarm may continue to be used for a 7-day period, provided the licensee or registrant implements the continuous surveillance requirements of He-P 4034.22 and an alarming ratemeter is used.

(f) Test records for entrance controls and audible and visual alarms shall be maintained in accordance with He-P 4034.31.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.14 Labeling, Storage, and Transportation.

(a) The licensee shall not use a source changer or a container to store radioactive material unless the source changer or the storage container has securely attached to it a durable, legible, and clearly visible label bearing the standard trefoil radiation caution symbol in conventional colors, having a minimum diameter of 25mm and the wording

CAUTION (or "DANGER")
RADIOACTIVE MATERIAL
NOTIFY CIVIL AUTHORITIES [or "NAME OF COMPANY"]

(b) The licensee shall not transport radioactive material unless the material is packaged, and the

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package is labeled, marked, and accompanied with appropriate shipping papers in accordance with He-P 4037.

(c) Radiographic exposure devices, source changers, storage containers, and radiation machines, shall be physically secured to prevent tampering or removal by unauthorized personnel.

(d) The licensee shall store radioactive material in a manner that will minimize danger from explosion or fire.

(e) The licensee shall lock and physically secure the transport package containing radioactive material in the transporting vehicle to prevent accidental loss, tampering, or unauthorized removal.

(f) The licensee's or registrant's name and city or town where the main business office is located shall be prominently displayed with a durable, clearly visible label(s) on both sides of all vehicles used to transport radioactive material or radiation machines for temporary job site use.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.15 Conducting Industrial Radiographic Operations.

(a) Whenever radiography is performed at a location other than a permanent radiographic installation, the radiographer shall:

(1) Be accompanied by at least one other qualified radiographer or an individual who has at a minimum met the requirements of He-P 4034.17.

(2) The second qualified individual on site shall observe the operations and be capable of providing immediate assistance to prevent unauthorized entry into the restricted area.

(3) Radiography shall not be performed if only one qualified individual is present.

(b) All radiographic operations shall be conducted in a permanent radiographic installation unless otherwise specifically authorized by the DHHS/BRH.

(c) Collimators shall be used in industrial radiographic operations that use crank-out devices except when physically impossible.

(d) A licensee or registrant shall conduct lay-barge, offshore platform, or underwater radiography only if procedures have been approved by the DHHS/BRH, the Nuclear Regulatory Commission, or another Agreement State.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.16 Radiation Safety Officer. The Radiation Safety Officer shall ensure that radiation safety activities are being performed in accordance with approved procedures and regulatory requirements in the daily operation of the licensee's or registrant's program.

(a) The minimum qualifications, training, and experience for RSOs for industrial radiography shall be

as follows:

- (1) Completion of the training and testing requirements of He-P 4034.17(a).
 - (2) 2000 hours of hands-on experience as a qualified radiographer in industrial radiographic operations; and
 - (3) Formal training in the establishment and maintenance of a radiation protection program.
- (b) The DHHS/BRH will consider alternatives when the RSO has appropriate training and/or experience in the field of ionizing radiation, and in addition, has adequate formal training with respect to the establishment and maintenance of a radiation safety protection program.
- (c) The specific duties and authorities of the RSO shall include, but shall not be limited to:
- (1) Establishing and overseeing all operating, emergency, and ALARA procedures as required by He-P 4020 through He-P 4023 and reviewing these procedures regularly to ensure that they conform to DHHS/BRH rules and the license or registration conditions;
 - (2) Overseeing and approving the training program for radiographic personnel to ensure that appropriate and effective radiation protection practices are taught;
 - (3) Ensuring that required radiation surveys and leak tests are performed and documented in accordance with He-P 4034, including any corrective measures when levels of radiation exceed established limits;
 - (4) Ensuring that personnel monitoring devices are calibrated, if applicable, and used properly;
 - (5) Ensuring that records are kept of the personnel monitoring results;
 - (6) Ensuring that timely notifications are made as required by He-P 4021.13; and
 - (7) Ensuring that working operations are conducted safely, that corrective actions are implemented, and that unsafe operations are terminated.
- (d) Licensees and registrants shall have 2 years from the effective date of this rule to meet the requirements of He-P 4034.16(a) and (b).

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.17 Training.

- (a) The licensee or registrant shall not permit any individual to act as a radiographer until the individual:
- (1) Has received 40 hours of training in the subjects in He-P 4034.17(g) in addition to a minimum of 2 months of on-the-job training;
 - (2) Is certified through a radiographer certification program by a certifying entity in accordance

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with the criteria specified in He-P 4034 Appendix A; and

(3) Has received training in the subjects outlined in He-P 4034.17(g) of this section and demonstrated an understanding of these subjects by successful completion of a written examination.

(b) In addition, the licensee or registrant shall not permit any individual to act as a radiographer until the individual:

(1) Has received copies of and instruction in the requirements described in the rules contained in this part, and applicable sections of He-P 4019 through He-P 4023 and He-P 4037, in the license or registration under which the radiographer will perform industrial radiography, and the licensee's or registrant's operating and emergency procedures;

(2) Has demonstrated an understanding of items in He-P 4034.17(b)(1) by successful completion of a written or oral examination;

(3) Has received training in the use of the registrant's radiation machines, or the licensee's radiographic exposure devices, sealed sources, in the daily inspection of devices and associated equipment, and in the use of radiation survey instruments; and

(4) Has demonstrated understanding of the use of the equipment described in He-P 4034.17(b)(1) and (b)(3) by successful completion of a practical examination.

(c) The licensee shall not permit any individual to act as a radiographer's assistant until the individual:

(1) Has received copies of and instruction in the requirements described in the rules contained in this part, and applicable sections of He-P 4019 through He-P 4023 and He-P 4037, in the license or registration under which the radiographer's assistant will perform industrial radiography, and the licensee's or registrant's operating and emergency procedures;

(2) Has demonstrated an understanding of items in He-P 4034.17(c)(1) by successful completion of a written or oral examination;

(3) Under the personal supervision of a radiographer, has received training in the use of the registrant's radiation machines, or the licensee's radiographic exposure devices, sealed sources, in the daily inspection of devices and associated equipment, and in the use of radiation survey instruments; and

(4) Has demonstrated understanding of the use of the equipment described in He-P 4034.17(c)(3) by successful completion of a practical examination.

(d) The licensee or registrant shall provide annual refresher safety training for each radiographer and radiographer's assistant at intervals not to exceed 12 months.

(e) Except as provided in He-P 4034.17(f)(4), the RSO or designee shall conduct an inspection program of the job performance of each radiographer and radiographer's assistant to ensure that the DHHS/BRH rules, license or registration requirements, and operating and emergency procedures are followed.

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(f) The inspection program required in He-P 4034.17(e) shall:

- (1) Include observation of the performance of each radiographer and radiographer's assistant during an actual industrial radiographic operation, at intervals not to exceed 6 months; and
- (2) Provide that, if a radiographer or a radiographer's assistant has not participated in an industrial radiographic operation for more than 6 months since the last inspection, the radiographer shall demonstrate knowledge of the training requirements of He-P 4034.17(b)(3) and the radiographer's assistant must demonstrate knowledge of the training requirements of He-P 4034.17(c)(3) by a practical examination before these individuals can next participate in a radiographic operation.
- (3) The DHHS/BRH may consider alternatives in those situations where the individual serves as both radiographer and RSO.
- (4) In those operations where a single individual serves as both radiographer and RSO, and performs all radiography operations, an inspection program is not required.

(g) The licensee or registrant shall maintain records of the above training, to include certification documents, written and practical examinations, refresher safety training and inspections of job performance in accordance with He-P 4034.31.

(h) The licensee or registrant shall include the following subjects in the training program required in He-P 4034.16(a):

- (1) Fundamentals of radiation safety including:
 - a. Characteristics of gamma radiation;
 - b. Units of radiation dose and quantity of radioactivity;
 - c. Hazards of exposure to radiation;
 - d. Levels of radiation from sources of radiation; and
 - e. Methods of controlling radiation dose (time, distance, and shielding);
- (2) Radiation detection instruments including:
 - a. Use, operation, calibration, and limitations of radiation survey instruments;
 - b. Survey techniques; and
 - c. Use of personnel monitoring equipment;
- (3) Equipment to be used including:
 - a. Operation and control of radiographic exposure equipment, remote handling equipment, and storage containers, including pictures or models of source assemblies (pigtailed);

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- b. Operation and control of radiation machines;
 - c. Storage, control, and disposal of sources of radiation; and
 - d. Inspection and maintenance of equipment.
- (4) The requirements of this Chapter and pertinent regulations in the Code of Federal Regulations; and
- (5) Case histories of accidents in radiography.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.18 Operating and Emergency Procedures.

- (a) Operating and emergency procedures shall include, as a minimum, instructions in the following:
- (1) Appropriate handling and use of sources of radiation so that no person is likely to be exposed to radiation doses in excess of the limits established in He-P 4020;
 - (2) Methods and occasions for conducting radiation surveys;
 - (3) Methods for posting and controlling access to radiographic areas;
 - (4) Methods and occasions for locking and securing sources of radiation;
 - (5) Personnel monitoring and the use of personnel monitoring equipment;
 - (6) Transporting equipment to field locations, including packing of radiographic exposure devices and storage containers in the vehicles, placarding of vehicles when required, and control of the equipment during transportation as required in He-P 4037;
 - (7) The inspection, maintenance, and operability checks of radiographic exposure devices, radiation machines, survey instruments, alarming ratemeters, transport containers, and storage containers;
 - (8) Steps that must be taken immediately by radiography personnel in the event a pocket dosimeter is found to be off-scale or an alarming rate meter alarms unexpectedly;
 - (9) The procedure(s) for identifying and reporting defects and noncompliance, as required by He-P 4034.37;
 - (10) The procedure for notifying proper persons in the event of an accident or incident;
 - (11) Minimizing exposure of persons in the event of an accident or incident, including a source disconnect, a transport accident, or loss of a source of radiation;
 - (12) Source recovery procedure if licensee will perform source recovery; and

(13) Maintenance of records.

(b) The licensee or registrant shall maintain copies of current operating and emergency procedures in accordance with He-P 4034.33 and He-P 4034.37.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.19 Supervision of Radiographers' Assistants.

(a) The radiographer's assistant shall be under the personal supervision of a radiographer when using sources of radiation or conducting radiation surveys required by He-P 4034.21(b) and (c) to determine that the sealed source has returned to the shielded position or the radiation machine is off after an exposure.

(b) The personal supervision required in He-P 4034.19(a) shall include:

- (1) The radiographer's physical presence at the site where the sources of radiation are being used;
- (2) The availability of the radiographer to give immediate assistance if required; and
- (3) The radiographer's direct observation of the assistant's performance of the operations referred to in this section.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.20 Personnel Monitoring.

(a) The licensee or registrant shall not permit any individual to act as a radiographer or a radiographer's assistant unless, at all times during radiographic operations, each individual wears, on the trunk of the body, a combination of direct reading dosimeter, an alarming ratemeter, and either a film badge or a thermoluminescent dosimeter (TLD).

(b) At permanent radiography installations where alarming or warning devices are in routine use, or during radiographic operations using radiation machines, the wearing of an alarming ratemeter is not required.

(c) Pocket dosimeters shall:

- (1) Have a range from zero to 2 millisieverts (200 mrem); and
- (2) Be recharged at the start of each shift.

(d) Electronic personal dosimeters shall only be used in place of ion-chamber pocket dosimeters.

(e) Each film badge and TLD shall be assigned to and worn by only one individual.

(f) Film badges and TLD's shall be exchanged at periods not to exceed one month.

(g) After replacement, each film badge or TLD shall be returned to the supplier for processing within 14 calendar days of the end of the monitoring period, or as soon as practicable.

(h) In circumstances that make it impossible to return each film badge or TLD in 14 calendar days, such circumstances shall be documented and available for review by the DHHS/BRH.

(i) Direct reading dosimeters such as pocket dosimeters or electronic personal dosimeters, shall:

- (1) Be read at the beginning and end of each shift;
- (2) Have the exposures recorded at the beginning and end of each shift; and
- (3) Be recorded in records maintained in accordance with He-P 4034.34.

(j) Pocket dosimeters, or electronic personal dosimeters, shall be checked at periods not to exceed 12 months in order to verify that readings are within plus or minus 20 percent of the true radiation exposure.

(k) Records resulting from the check of pocket dosimeters or electronic personal dosimeters shall be maintained in accordance with He-P 4034.34.

(l) If an individual's pocket dosimeter is found to be off-scale, or the electronic personal dosimeter reads greater than 2 millisieverts (200 mrem):

- (1) The individual's film badge or TLD shall be sent for processing within 24 hours;
- (2) The individual shall not resume work associated with the use of sources of radiation until a determination of the individual's radiation exposure has been made by the RSO or the RSO's designee;
- (3) The results of this determination must be included in the records maintained in accordance with He-P 4034.34.

(m) If a film badge or TLD is lost or damaged, the worker shall cease work immediately until a replacement film badge or TLD is provided and the exposure is calculated for the time period from issuance to loss or damage of the film badge or TLD. The results of the calculated exposure required in He-P 4034.19(m) and the time period for which the film badge was lost or damaged shall be included in the records maintained in accordance with He-P 4034.33.

(n) Reports received from the film badge or TLD processor shall be retained in accordance with He-P 4034.34.

(o) Each alarming ratemeter shall:

- (1) Be checked to ensure that the alarm functions properly before using at the start of each shift;
- (2) Be set to give an alarm signal at a preset dose rate of 5 millisieverts per hour (500 mrem/hr); with an accuracy of plus or minus 20 percent of the true radiation dose rate;
- (3) Require special means to change the preset alarm function;
- (4) Be calibrated at periods not to exceed 12 months for correct response to radiation; and

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- (5) Have its calibration history maintained by the licensee in accordance with He-P 4034.34.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.21 Radiation Surveys. The licensee or registrant shall:

(a) Conduct surveys with a calibrated and operable radiation survey instrument that meets the requirements of He-P 4034.09.

(b) Using a survey instrument meeting the requirements of He-P 4034.21(a), conduct a survey of the radiographic exposure device and the guide tube.

(c) The survey required in He-P 4034.21(b) shall determine that the sealed source has returned to its shielded position before exchanging films, repositioning the exposure head, or dismantling equipment.

(d) Survey radiation machines after each exposure to determine that the machine is off.

(e) Conduct a survey of the radiographic exposure device with a calibrated radiation survey instrument whenever the source is exchanged and whenever a radiographic exposure device is placed in a storage area as defined in He-P 4003.01(ef), to ensure that the sealed source is in its shielded position.

(f) Maintain records in accordance with He-P 4034.35.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.22 Surveillance. During each radiographic operation, the radiographer shall ensure continuous direct visual surveillance of the operation to protect against unauthorized entry into a radiation area or a high radiation area, as defined in He-P 4003, except at permanent radiographic installations where all entryways are locked and the requirements of 4034.13 are met.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.23 Posting.

(a) All areas in which industrial radiography is being performed shall be conspicuously posted as required by He-P 4022.11.

(b) The exceptions listed in He-P 4022.12 of this chapter do not apply to industrial radiographic operations.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.24 Records for Industrial Radiography. Each licensee or registrant shall maintain a copy of its license or registration, documents incorporated by reference, and amendments to each of these items until superseded by new documents approved by the DHHS/BRH, or until the DHHS/BRH terminates the license or registration.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.25 Records of Receipt and Transfer of Sources of Radiation.

(a) Each licensee or registrant shall maintain records showing the receipts and transfers of sealed sources, devices using DU for shielding, and radiation machines, and retain each record for 3 years after it is made.

(b) These records shall include the date, the name of the individual making the record, radionuclide, number of becquerels (curies) or mass (for DU), and manufacturer, model, and serial number of each source of radiation and/or device, as appropriate.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.26 Records of Radiation Survey Instruments. Each licensee or registrant shall maintain records of the calibrations of its radiation survey instruments that are required under He-P 4034.09 and retain each record for 3 years after it is made.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.27 Records of Leak Testing of Sealed Sources and Devices Containing DU.

(a) Each licensee shall maintain records of leak test results for sealed sources and for devices containing DU in units of becquerels (mCi).

(b) The licensee shall retain each record for 3 years after it is made or until the source in storage is removed.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.28 Records of Quarterly Inventory.

(a) Each licensee or registrant shall maintain records of the quarterly inventory of sources of radiation, including devices containing depleted uranium as required by He-P 4034.11, and retain each record for 3 years.

(b) The record shall include the date of the inventory, name of the individual conducting the inventory, radionuclide, number of becquerels (curies) or mass (for DU) in each device, location of sources of radiation and/or devices, and manufacturer, model, and serial number of each source of radiation and/or device, as appropriate.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.29 Utilization Logs.

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(a) Each licensee or registrant shall maintain utilization logs showing for each source of radiation the following information:

- (1) A description, including the make, model, and serial number of the radiation machine or the radiographic exposure device, transport, or storage container in which the sealed source is located;
 - (2) The identity or signature of the radiographer to whom assigned;
 - (3) The location and dates of use, including the dates removed and returned to storage; and
 - (4) For permanent radiographic installations, the dates each radiation machine is energized.
- (b) The licensee or registrant shall retain the logs required by He-P 4034.29(a) for 3 years.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.30 Records of Inspection and Maintenance of Radiation Machines, Radiographic Exposure Devices, Transport and Storage Containers, Associated Equipment, Source Changers, and Survey Instruments.

(a) Each licensee or registrant shall maintain records specified in He-P 4034.12 of equipment problems found in daily checks and quarterly inspections of radiation machines, radiographic exposure devices, transport and storage containers, associated equipment, source changers, and survey instruments; and retain each record for 3 years after it is made.

(b) The record shall include the date of check or inspection, name of inspector, equipment involved, any problems found, and what repair and/or maintenance, if any, was performed.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.31 Records of Alarm System and Entrance Control Checks at Permanent Radiographic Installations. Each licensee or registrant shall maintain records of alarm system and entrance control device tests required by He-P 4034.13 and retain each record for 3 years after it is made.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.32 Records Of Training And Certification. Each licensee or registrant shall maintain the following records for 3 years:

(a) Records of training of each radiographer and each radiographer's assistant to include radiographer certification documents and verification of certification status, copies of written tests, dates of oral and practical examinations, and names of individuals conducting and receiving the oral and practical examinations.

(b) Records of annual refresher safety training and semi-annual inspections of job performance for each radiographer and each radiographer's assistant.

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(c) The records required in He-P 4034.32(b) shall list the topics discussed during the refresher safety training, the dates the annual refresher safety training was conducted, and names of the instructors and attendees.

(d) For inspections of job performance, the records shall also include a list showing the items checked and any non-compliance observed by the RSO.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.33 Copies of Operating and Emergency Procedures.

(a) Each licensee or registrant shall maintain a copy of current operating and emergency procedures until the DHHS/BRH terminates the license or registration.

(b) Superseded material in the operating and emergency procedures must be retained for 3 years after the change is made.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.34 Records of Personnel Monitoring. Each licensee or registrant shall maintain the following exposure records specified in He-P 4034.20.

(a) Direct reading dosimeter readings and yearly operability checks required by He-P 4034.20(h) and (i) for 3 years after the record is made;

(b) Records of alarming ratemeter calibrations for 3 years after the record is made;

(c) Reports received from the film badge or TLD processor until the DHHS/BRH terminates the license or registration; and

(d) Records of estimates of exposures as a result of off-scale personal direct reading dosimeters, or lost or damaged film badges or TLD's, until the DHHS/BRH terminates the license or registration.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.35 Records of Radiation Surveys.

(a) Each licensee shall maintain a record of each exposure device survey conducted before the device is placed in storage as specified in He-P 4034.21(d).

(b) Each record must be maintained for 3 years after it is made.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.36 Form of Records.

- (a) Each record required by He-P 4034 must be legible throughout the specified retention period.
- (b) The record shall be the original or a reproduced copy or a microform provided that the copy or microform is authenticated by an individual authorized by the registrant or licensee and that the microform is capable of reproducing a clear copy throughout the required retention period.
- (c) The record may also be stored in electronic media with the capability for producing legible, accurate, and complete records during the required retention period.
- (d) Records, such as letters, drawings, and specifications, shall include all pertinent information, such as stamps, initials, and signatures.
- (e) The licensee or registrant shall maintain adequate safeguards against tampering with and loss of records.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.37 Location Of Documents and Records.

- (a) Each licensee or registrant shall maintain copies of records required by He-P 4034 and other applicable parts of these rules at the location specified in He-P 4034.05(k).
- (b) Each licensee or registrant shall also maintain copies of the following documents and records sufficient to demonstrate compliance at each applicable field station and each temporary jobsite:
 - (1) The license or registration authorizing the use of sources of radiation;
 - (2) A copy of He-P 4003, He-P 4019 through He-P 4023 and He-P 4034;
 - (3) Utilization records for each source of radiation-dispatched from that location as required by He-P 4034.29;
 - (4) Records of equipment problems identified in daily checks of equipment as required by He-P 4034.30(a);
 - (5) Records of alarm system and entrance control checks required by He-P 4034.31, if applicable;
 - (6) Records of dosimeter readings as required by He-P 4034.34;
 - (7) Operating and emergency procedures required by He-P 4034.33;
 - (8) Evidence of the latest calibration of the radiation survey instruments in use at the site, as required by He-P 4034.26;
 - (9) Evidence of the latest calibrations of alarming ratemeters and operability checks of dosimeters as required by He-P 4034.34;

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- (10) Survey records as required by He-P 4034.35 and He-P 4021.03 as applicable, for the period of operation at the site;
- (11) The shipping papers for the transportation of radioactive materials required by He-P 4037; and
- (12) When operating under reciprocity pursuant to He-P 4030.17, a copy of the Agreement State license or registration, or NRC license authorizing the use of sources of radiation.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.38 Notifications.

(a) In addition to the reporting requirements specified in He-P 4021, each licensee or registrant shall provide a written report to the DHHS/BRH within 30 days of the occurrence of any of the following incidents involving radiographic equipment:

- (1) Unintentional disconnection of the source assembly from the control cable;
- (2) Inability to retract the source assembly to its fully shielded position and secure it in this position;
- (3) Failure of any component, which is critical to safe operation of the device, to properly perform its intended function;
- (4) Failure of an indicator on a radiation machine to show that radiation is being produced;
- (5) Failure of an exposure switch to terminate production of radiation when switched to the off position; and
- (6) Failure of a safety interlock to terminate x-ray production.

(b) The licensee or registrant shall include the following information in each report submitted under He-P 4034.38(a), and in each report of overexposure submitted under He-P 4021.14 which involves failure of safety components of radiography equipment:

- (1) Description of the equipment problem;
- (2) Cause of each incident, if known;
- (3) Name of the manufacturer and model number of equipment involved in the incident;
- (4) Place, date, and time of the incident;
- (5) Actions taken to establish normal operations;
- (6) Corrective actions taken or planned to prevent recurrence; and
- (7) Names and qualifications of personnel involved in the incident.

(c) Any licensee or registrant conducting radiographic operations or storing sources of radiation at any location not listed on the license or registration for a period in excess of 180 days in a calendar year, shall notify the DHHS/BRH prior to exceeding the 180 days.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034.39 Specific Requirements for Radiographic Personnel Performing Industrial Radiography

(a) At a job site, the following shall be supplied by the licensee or registrant:

- (1) At least one operable, calibrated survey instrument for each exposure device or radiation machine in use;
- (2) A current whole body individual monitoring device (TLD or film badge) for each worker;
- (3) An operable, calibrated pocket dosimeter with a range of zero to 200 milliroentgens for each worker;
- (4) An operable, calibrated, alarming ratemeter for each worker; and
- (5) The appropriate barrier ropes and caution signs.

(b) Each radiographer at a job site shall have on their person a valid certification ID card issued by a certifying entity.

(c) Industrial radiographic operations shall not be performed if any of the items in He-P 4034.39(a) are not available at the job site or are inoperable.

(d) During an inspection, the DHHS/BRH shall terminate an operation if any of the items in He-P 4034.39(a) are not available or operable, or if the required number of radiographic personnel are not present.

(e) Operations terminated under the conditions of He-P 4034.39(d) shall not be resumed until all required conditions are met.

Source. (See Revision Note at part heading for He-P 4034)
#6942, eff 2-1-99

He-P 4034

APPENDIX A

I. Requirements for an Independent Certifying Organization.

An independent certifying organization shall:

1. Be an organization such as a society or association, whose members participate in, or have an interest in, the field of industrial radiography;
2. Make its membership available to the general public nationwide that is not restricted because of race, color, religion, sex, age, national origin or disability;
3. Have a certification program open to nonmembers, as well as members;
4. Be an incorporated, nationally recognized organization, that is involved in setting national standards of practice within its fields of expertise;
5. Have an adequate staff, a viable system for financing its operations, and a policy and decision-making review board;
6. Have a set of written organizational by-laws and policies that provide adequate assurance of lack of conflict of interest and a system for monitoring and enforcing those by-laws and policies;
7. Have a committee, whose members can carry out their responsibilities impartially, to review and approve the certification guidelines and procedures, and to advise the organization's staff in implementing the certification program;
8. Have a committee, whose members can carry out their responsibilities impartially, to review complaints against certified individuals and to determine appropriate sanctions;
9. Have written procedures describing all aspects of its certification program, maintain records of the current status of each individual's certification and the administration of its certification program;
10. Have procedures to ensure that certified individuals are provided due process with respect to the administration of its certification program, including the process of becoming certified and any sanctions imposed against certified individuals;
11. Have procedures for proctoring examinations, including qualifications for proctors. These procedures must ensure that the individuals proctoring each examination are not employed by the same company or corporation (or a wholly-owned subsidiary of such company or corporation) as any of the examinees;
12. Exchange information about certified individuals with the Commission and other independent certifying organizations and/or Agreement States and allow periodic review of its certification program and related records; and
13. Provide a description to the Commission of its procedures for choosing examination sites and for providing an appropriate examination environment.

II. Requirements for Certification Programs.

All certification programs must:

1. Require applicants for certification to (a) receive training in the topics set forth in He-P 4034.17(h) or equivalent Agreement State or Nuclear Regulatory Commission regulations, and (b) satisfactorily complete a written examination covering these topics;
2. Require applicants for certification to provide documentation that demonstrates that the applicant has:
 - (a) received training in the topics set forth in He-P 4034.17(h) or equivalent Agreement State or NRC regulations;
 - (b) satisfactorily completed a minimum period of on-the-job training; and
 - (c) received verification by an Agreement State licensee or registrant or a NRC licensee that the applicant has demonstrated the capability of independently working as a radiographer.
3. Include procedures to ensure that all examination questions are protected from disclosure;
4. Include procedures for denying an application and, revoking, suspending, and reinstating a certification;
5. Provide a certification period of not less than 3 years nor more than 5 years;
6. Include procedures for renewing certifications and, if the procedures allow renewals without examination, require evidence of recent full-time employment and annual refresher training; and
7. Provide a timely response to inquiries, by telephone or letter, from members of the public, about an individual's certification status.

III. Requirements for Written Examinations

All examinations must be:

1. Designed to test an individual's knowledge and understanding of the topics listed in He-P 4034.17(h) or equivalent Agreement State or NRC requirements;
2. Written in a multiple-choice format;
3. Have test items drawn from a question bank containing psychometrically valid questions based on the material in He-P 4034.17(h).